

## Plug-and-Play Cost Objects for Estimating Space Science Missions

Based on methodology supporting NASA missions for 25 years and derived from the Chicago Cost Model (ChiCoMo) used by NASA, the PRICE® TruePlanning® Space Missions Catalog is a robust set of cost models for estimating space science missions fast, credibly and defensibly.

Space Missions combines the power of the TruePlanning® framework, the PRICE® Hardware model, and PRICE® Research to serve as a one-stop tool for estimating entire missions—from component to system levels through design, fabrication, assembly integration & test, and launch operations, as well as the costs of support functions for each of these activities.

### Replaces time-consuming, complex processes with drag-and-drop automation

Space Missions tailors the PRICE® Hardware model for NASA programs. Each model in the catalog contains a complete parametric, activity-based, cost estimating model. Estimators simply select, drag and drop models containing fully researched and implemented cost estimating relationships (CERs) into TruePlanning®, which calculates estimates based on the selections. Estimators also have the option to override CERs within a model, but the true value of Space Missions is to take advantage of the TruePlanning® framework and models resulting from research developed from NASA programs such as Mariner and New Frontiers.

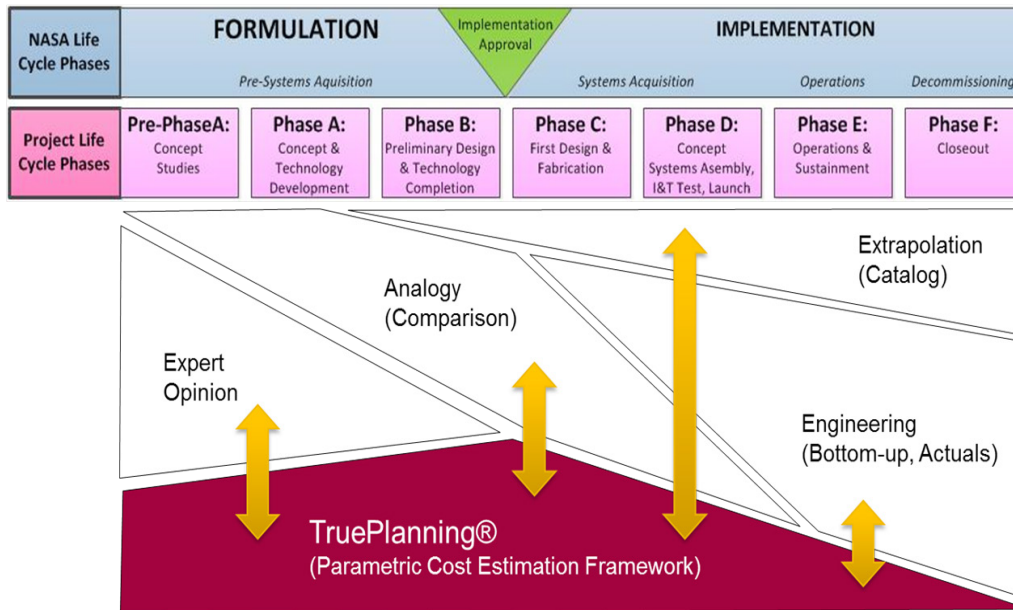
The models incorporate detailed data collection and analysis, including component-level cost and technical data, project-level cost and programmatic data, and trusted algorithms from TruePlanning® hardware and assembly and ChiCoMo models. All cost objects produce cost driver values engineered by experts with over 100 person-years of combined PRICE/NASA experience.

### Key Features

- Custom implementation of TruePlanning® hardware and assembly models for space missions
- Fully interactive parametric cost estimating for spacecraft and payloads
- Cost models with pre-set inputs (and overrides) for TruePlanning® calculations (based on TruePlanning® and ChiCoMo algorithms)
- Estimates align with and map to NASA WBS and life cycle phases
- Supports multiple cost risk analysis methodologies (Method of Moments, Monte Carlo Simulation)
- Easy drag-and-drop GUI
- Interoperability with other tools

### Key Benefits

- Credible, defensible estimates based on historical data and clearly understood parameters
- Increases breadth and depth of analysis
- Automates methods to handle the high volume of estimating details and calculations faster
- Improves estimating visibility, reporting and transparency
- Reduces effort for model users and SME feedback



Space Missions Catalog for TruePlanning® supports multiple levels of estimation. Hardware estimates are developed at the subsystem component-level and the resultant estimate is divided into four activity-based development phases (Design, Fabrication, Assembly/Integration & Test and Launch Operations). In project life cycles for the NASA Programs, the cost models estimate Phase B (Formulation) through Phases C and D (Implementation) costs for materials, activities and resources.

## Space Missions Cost Estimating Methodology

Estimating with Space Missions starts at the component level and builds up. The catalog's selectable component types cover all spacecraft bus and/or payload subsystem functions. The component models drive the inputs for TruePlanning's hardware cost calculations based on component type, platform, parts class, mass, number of units, heritage, use of advanced technology development, and material type in alignment with calibration and research for many NASA space missions.

The model leverages CERs at the component level for development engineering, manufacturing, tooling and testing, and translates them into activity-based costing for design. The CERs are also translated for production engineering, manufacturing, tooling and testing into activity-based costing for fabrication. The catalog's assembly cost objects model the design and cost of typical subsystem integrations. Space system objects estimate program support functions based on ChiCoMo algorithms for activities such as project management, system engineering, safety and mission assurance, mission operation system, assembly and integration support, system test, and ground support equipment.

## Space Missions Cost Objects

### Space Component Cost Objects

- Estimate Design and Fabrication via TruePlanning® hardware calculations
- Include new component-level cost objects built on custom CER implementations

### Space Assembly Cost Objects

- Estimate the Design and Fabrication costs associated with the assembly of hardware in a subsystem.

### Space Subsystem Cost Objects

- Estimate subsystem-level Launch Operations and Instrument Assembly Integration and Test (launch operations through on-orbit checkout)

### Space System Cost Objects

- Estimate project support costs for spacecraft and/or payload